

REMARKS

In reply to the Office Action of July 17, 2008, Applicant submits the following remarks.

Claims 1, 4-12, 14, 16, 19-20 and 24-25 have been amended. Support for the amendment to claims 1 and 14 can be found at least in formerly pending claims 2, 19 and 23, the figures and the accompanying text of the specification as filed, which can be seen as U.S. Publication 2008/0001162. Claims 25 has been amended to further define the scope of the claim and is supported at least by FIGS. 2A and 2B and page 14, line 1-17 or paragraph 40 of the publication. Claims 4-10, 16 and 24 have been amended to correct claim dependence or terminology after cancellation or amendment of claims from which they depend. Claims 12 and 14 have been amended to clarify the scope of the claim by amending terminology. Claim 19 was amended to describe the conducting material as a metal. Claims 2, 15 and 23 are canceled. Applicant respectfully requests reconsideration in view of the foregoing amendments and these remarks.

Claims 1, 7, 11 and 23

Claims 1, 7, 11 and 23 were rejected as being anticipated by U.S. Patent No. 5,420,078 ("Sikora"). Claim 2 was rejected as being obvious and therefore unpatentable over Sikora in view of U.S. Patent No. 5,431,770 ("Lee"). The subject matter of claim 2 has been incorporated into claim 1. Each of claims 7, 11, 14 and 23 depend from claim 1. Applicant respectfully traverses the rejection based on the amendments to claim 1.

Amended claim 1 is directed to a process that includes forming a first layer on a substrate, forming a second layer on the first layer, generating on the second layer a mask with a first structure and second structure, performing an isotropic process on the second layer, which transfers the first structure into the second layer, and after performing the isotropic process, performing an anisotropic process on the first layer, which transfers the second structure into the first layer wherein the first structure is different than the second structure.

Sikora describes a method for forming holes in an dielectric layer 24 using an isotropic etch (col. 3, lines 38-52). The dielectric layer 24 is then anisotropically etched.

Lee describes forming a photoresist 21, which is used as a mask to etch layer 19 to form feature 23 (FIGS. 1-4, col. 1, line 65-col. 2, line 45). Feature 23 sits atop layers 17, 15 and 13. The feature 23 is then isotropically etched to form a smaller raised feature 25. Feature 25 is used as a hardmask to anisotropically etch features out of the layers below the hardmask, that is, layers 17, 15 and 13.

Sikora and Lee both describe performing an isotropic etch and an anisotropic etch. However, they both fail to suggest or disclose (1) a mask with a first structure that is different from a second structure and (2) performing an isotropic process on a second layer, which transfers the first structure of a mask into the second layer, and after performing the isotropic process, performing an anisotropic process on a first layer, which transfers the second structure of the mask into the first layer.

The Examiner acknowledges that Sikora does not describe a first etch on a first layer and a second etch on a second layer and turns to Lee for describing etching a hardmask layer and then etching a conductive layer under the hardmask layer. However, the mask in Sikora and the mask in Lee each has a single structure. That is, the mask has only a single pattern that is transferred to the entirety of the dielectric layer in Sikora and to each layer in Lee. Thus, the masks do not have a first structure and a second structure, as required by amended claim 1.

Moreover, Lee etches the same structure into each of the layers below the feature 25. Thus, Lee's process results in a multilayered etched feature where each layer is the same size and has the same profile as the layer below. Sikora's process results in a recess with a different geometry (straight walled) in a portion below another portion (tapered). Neither Sikora nor Lee describe or suggest transferring a first structure of a mask into a second layer and transferring a second structure of a mask into a second layer, as required by amended claim 1. For at least these reasons, applicant submits that there is no *prima facie* case of obviousness pending with respect to claim 1 and the claims that depend therefrom.

Claim 14

Amended claim 14 was rejected as being anticipated by Sikora. Applicant respectfully traverses in light of the amendment of claim 14.

Amended claim 14 requires a first layer and a second layer on the substrate, where the first layer is different from the second layer, the second layer is structured into a first structure, the first layer is structured into a second structure and the first layer is between the second layer and the substrate. The first structure in the second layer is structured by an isotropic structuring process, and the second structure is structured by an anisotropic structuring process and the first structure is different from the second structure.

As noted above, Sikora does not describe two layers that are etched such that a second layer is structured into a first structure, a first layer is structured into a second structure, the first layer is between the second layer and a substrate, where the first structure is different from the second structure. Sikora describes one recess that has a different profile at a top than at the bottom because of the etching process that is used to form the top of the recess differs from the process used to form the bottom of the recess. Amended claim 14 requires a first layer with a different structure etched into it than a second layer and thus is not anticipated by Sikora.

Claims 3 and 25-27

Claims 3 and 25-27 were rejected as being obvious and therefore unpatentable over Sikora in view of Lee along with U.S. Patent No. 6,468,439 ("Whitehurst").

Regarding claim 3, Whitehurst also fails to suggest or disclose a mask with a first structure and a second structure and performing an isotropic process on a second layer, which transfers the first structure into the second layer, and after performing the isotropic process, performing an anisotropic process on a first layer, which transfers the second structure into the first layer. Thus, there is no *prima facie* case of obviousness pending with respect to claim 3.

Amended claim 25 requires a substrate having a main surface with a structure in a direction perpendicular to the main surface of the substrate has a geometric form with a perimeter that has recessed areas deviating from the geometric form.

All of Sikora, Lee and Whitehurst fail to suggest or disclose a substrate with a structure that in a direction perpendicular to the main surface of the substrate has a geometric form with a perimeter that has recessed areas deviating from the geometric form. Sikora, Lee and Whitehurst all describe etched features and show a side view of the etched feature. Sikora and Lee do not show a plan view of the device and do not describe the geometry of the features formed on a substrate. Whitehurst shows a structure formed from multiple layers of metal 52, 54, 56 (Figs. 3a and 3b, col. 18, lines 13-35). The intermediate layer of metal 52 forms posts that support a circuit segment 58 with a narrowed section 68. The narrowed section is essentially a bowed portion. There are no recessed areas deviating from the bowed portion. Thus, none of Sikora, Lee or Whitehurst describe a structure that has a substrate with a structure that in a direction perpendicular to the main surface of the substrate has a geometric form with a perimeter that has recessed areas deviating from the geometric form. There is no *prima facie* case of obviousness pending with respect to claims 25-27.

Claims 5, 6, 8-10, 12-13 and 16-22

Claims 5, 6, 8-10, 12-13 and 16-22 were rejected as being obvious and therefore unpatentable over Sikora in view of Lee along with U.S. Patent No. 4,650,543 ("Kishita").

Regarding claims 5, 6, 8-10 and 12-13, Sikora, Lee and Kishita fail to suggest or disclose transferring a first structure of a mask into a second layer and transferring a second structure of a mask into a second layer, as required by amended claim 1. Nor do Sikora, Lee and Kishita suggest or disclose a mask with a first structure and a second structure, as required by amended claim 1. For at least these reasons, there is no *prima facie* case of obviousness pending with respect to claims 5, 6, 8-10 and 12-13.

Claims 16-22 depend from claim 14. Sikora, Lee and Kishita each fail to suggest or disclose a first layer with a different structure etched into it than a second layer, as required by amended claim 14. For at least these reasons, there is no *prima facie* case of obviousness pending with respect to claims 16-22.


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Applicant submits that U.S. Patent No. 7,358,195 fails to suggest or disclose any of the elements required by the claims and lacking in Sikora, Lee, Whitehurst or Kishita, as described above.

The three-month extension of time fee in the amount of \$1110 is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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